

United States Patent Application

Title of the Invention

A STEEL STRIP DESCALING APPARATUS AND A  
STEEL STRIP MANUFACTURING APPARTUS USING THE  
DESCALING APPARATUS

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## Specification

### 1. Title of the Invention

A steel strip descaling apparatus and a steel strip manufacturing apparatus using the descaling apparatus

### 2. Background of the Invention

A technique that removes an oxide (scale) formed on the surface of steel strips by electrolyzing scale in solutions such as a neutral salt, a nitrate and a sulfate is known.

The Japanese patent Laid-open No. 3-56699 describes pumping an electrolyte to a steel strip submerged in the electrolyte from the hole of an electrode in order to prevent the steel strip waving.

The Japanese patent Laid-open No. 8-100299 describes spraying an electrolyte to a steel strip in the air in order to apply an electric current.

### 3. Summary

However, in the art of No. 3-56699, because electrolyte and an electric conductor do not contact each other directly, a large quantity of electrolyte is necessary. The apparatus is large because of a large electrolyte bath. And because electrodes are also located in the electrolyte, short circuits occur among the electrodes through the electrolyte.

In the art of No. 8-100299, because whirls occur between an electrode and the steel strip, electric current provided to the steel strip from the electrodes is small and the electric current is variable. Therefore the steel strip

is not descaled rapidly and uniformly because of the variable electric current. We can not produce a steel strip which has uniformly beautiful surfaces with this art.

The present invention relates to a steel strip descaling apparatus and a steel strip manufacturing apparatus.

The purpose of the present invention is to provide the steel strip descaling apparatus and the steel strip manufacturing apparatus which improve the electric power efficiency, processing speed and miniaturization.

To achieves the above purpose, a feature of the present invention is that electrodes have jet openings which jet the electrolyte to the steel strip, that is to say, the electrode is integrated with the nozzle which jets an electrolyte.

With these electrodes, by jetting the electrolyte to the steel strip in the air and applying a voltage to the electrode, the scale (oxide coating or layer) on the surface of the steel strip is removed.

Acceding to a feature of the present invention, it is possible to reduce the size of an electrolyte tank storing the electrolyte, because the quantity of an electrolyte decreases by jetting the electrolyte in the air. Therefore, the descaling apparatus is miniaturized.

In contact to the conventional art submerging steel strip, because a short-circuit electric current through an